

What is claimed is:

1. A hydraulic tensioner for imparting tension to a chain comprising:

a housing having a retraction blocking member opening extending into a piston hole in an interior of the housing;

a hollow piston that is axially slidable in the piston hole, the piston having an inside space that forms a fluid chamber with the piston hole, the piston comprising a plurality of rack teeth on at least a portion of an outer circumference of the piston;

a piston spring provided in the piston hole, wherein the piston spring urges the piston in an extending direction;

a retraction blocking member located in the retraction blocking member opening and disposed adjacent to the rack teeth of the piston, the retraction blocking member comprising a teeth portion engageable with the rack teeth of the piston and adapted to permit movement of the piston in the extending direction but to prevent movement in a retracting direction; and

a retraction blocking member spring urging the teeth portion to engage with the rack teeth;

wherein the retraction blocking member has a width greater than that of a tip portion of the rack teeth of the piston.

2. The hydraulic tensioner of claim 1:

wherein the retraction blocking member opening comprises a pawl hole;

wherein the retraction blocking member comprises a pawl member provided in the pawl hole, wherein there is an axial clearance between the pawl hole and the pawl member;

6 wherein the retraction blocking member spring comprises a pawl spring;
7 and

8 wherein the width of the retraction blocking member comprises a width of
9 the pawl member.

1 3. The hydraulic tensioner of claim 1, wherein the retraction blocking member has a
2 width greater than that of a bottom portion of the rack teeth of the piston.

1 4. The hydraulic tensioner of claim 1, wherein the retraction blocking member has a
2 width greater than that of an outer diameter of the piston.

1 5. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring
2 comprises at least one U-shaped bent portion symmetrically disposed about an
3 axial centerline of the piston, the bent portion contacting a back surface of the
4 retraction blocking member.

1 6. The hydraulic tensioner of claim 5, wherein the U-shaped bent portion is formed by
2 bending a band-shaped sheet of metal.

1 7. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring
2 comprises two U-shaped bent portions which form a W-shaped bent portion,
3 wherein each U-shaped portion is symmetrically disposed about an axial centerline
4 of the piston, the bent portion contacting a back surface of the retraction blocking
5 member.

1 8. The hydraulic tensioner of claim 1, wherein the retraction blocking member spring
2 comprises at least one U-shaped bent portion and the retraction blocking member
3 comprises at least one axially extending groove on a back surface thereof, such that
4 the U-shaped bent portion of the retraction blocking member spring engages the
5 groove.

1 9. The hydraulic tensioner of claim 8, wherein the U-shaped bent portion is formed by
2 bending a band-shaped sheet of metal.

1 10. The hydraulic tensioner of claim 1, wherein the hydraulic tensioner further comprises
2 a pair of engagement recesses and the retraction blocking member spring
3 comprises a pair of engaging hooks on opposite ends thereof such that the
4 engaging hooks of the retraction blocking member spring engage the engagement
5 recesses.

1 11. The hydraulic tensioner of claim 1, wherein the housing comprises a check valve at a
2 bottom portion of the piston hole, wherein the check valve permits fluid flow into
3 the fluid chamber but blocks reverse flow out of the fluid chamber.

1 12. The hydraulic tensioner of claim 1, wherein the housing comprises a material having a
2 hardness lower than a hardness of a material that comprises the retraction blocking
3 member.

1 13. The hydraulic tensioner of claim 1, wherein the housing is composed of aluminum.

1 14. The hydraulic tensioner of claim 1, wherein the retraction blocking member comprises
2 a front end surface and a rear end surface, and the retraction blocking member
3 opening comprises a retraction blocking member opening surface such that the
4 front end surface or the rear end surface of the retraction blocking member contacts
5 the retraction blocking member opening surface when the retraction blocking
6 member extends or retracts.

1 15. The hydraulic tensioner of claim 1, wherein the retraction blocking member opening
2 comprises a retainer hole radially penetrating into the piston hole, and the
3 retraction blocking member comprises:

4 a pawl member located in the retainer hole and disposed adjacent to the
5 rack teeth of the piston, wherein the pawl member comprises the
6 teeth portion engageable with the rack teeth of the piston; and

7 a pawl retainer mounted on the retainer hole and having a pawl housing
8 hole for housing the pawl member;

9 wherein the retraction blocking member spring comprises a pawl spring;

10 and

11 wherein a width of an attachment surface of the pawl retainer relative to the
12 retainer hole is the retraction blocking member width.

1 16. The hydraulic tensioner of claim 15, wherein the housing further comprises a
2 counterbore at an opening end of the piston hole, the counterbore having a greater
3 diameter than a diameter of the piston hole, and wherein the pawl retainer
4 comprises a lower elongated end disposed in a vicinity of the rack teeth of the
5 piston, such that the lower elongated end of the pawl retainer prevents the piston
6 from rotating.